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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,609	02/14/2005	Gabriels E. Joseph Jr.	MCA-614 US	9978

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MILLIPORE CORPORATION
290 CONCORD ROAD
BILLERICA, MA 01821

EXAMINER	
LIU, SUE XU	
ART UNIT	**PAPER NUMBER**
1639	
MAIL DATE	**DELIVERY MODE**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/524,609	JOSEPH JR. ET AL.	
	Examiner	Art Unit	
	Sue Liu	1639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *6/28/07*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 16-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 16-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/14/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Status

1. Claims 4-15 have been cancelled as filed on 6/7/07.

Claims 16-20 have been added as filed on 6/7/07.

Claims 1-3 and 16-20 are currently pending.

Claims 1-3 and 16-20 are being examined in this application.

Election/Restrictions

2. Applicant's election without traverse of Group 1 (Claims 1-3) in the reply filed on 6/7/07 is acknowledged.

3. Applicants have added new claims 16-20, which are grouped together with Group 1 invention and are examined in this application.

Priority

4. This application is filed under 35 U.S.C 371 of PCT/US03/26557 (filed on 08/25/2003), which claims priority to US provisional applications 60/406,654 (filed on 8/28/2002).

Information Disclosure Statement

5. The IDS filed on /2/14/2005 has been considered. See the attached PTO 1449 forms.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites "further comprising transferring said resuspended product to a substrate for sequencing", which is unclear. The claim language of the instant claim 3 seems to state that the "suspended" sequencing products is subjected to further (or another round of) sequencing reaction. It is not clear how the "sequencing product" (with attached dye labels) can be subjected to further sequencing reaction.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

(Note: the instant claim numbers are in bold font.)

Leonard and Bjerke

9. Claims 1-3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leonard et al (WO 01/19482; 3/22/2001; cited in IDS), in view of Bjerke et al (WO 02/44414; 6/6/2002; priority date 11/21/2001 or earlier; cited in IDS).

The instant claims recite a method for purifying sequencing reaction product by removing unincorporated dye terminators from a sequencing reaction, comprising: providing sequencing reaction product; providing at least one ultrafiltration membrane having at least one surface; providing a solution comprising an amount of guanidine effective for removing unincorporated dye terminators from said sequencing reaction; introducing said sequencing reaction product and said solution to said at least one surface of said ultrafiltration membrane; applying a driving force to said ultrafiltration membrane to produce purified sequencing reaction product.

Leonard et al, throughout the publication, teach a method of purifying sequencing reaction product using ultrafiltration membrane to remove contaminant such as the dye terminators (e.g. Abstract; p.3, lines 24+). The reference teaches providing a quantity of sequencing reaction product and one ultrafiltration membrane (e.g. Claim 1 of the reference), which reads on the first two steps of **clm 1**. The reference also teaches suspending the sequencing reaction products in a solvent and applying the mixture to the membrane (e.g. Claims 1, 4 and 5), which read on the steps of providing a solution and introducing the mixture to the membrane of **clm 1**. The reference also teaches applying a force or a pressure to the membrane (e.g. Claims 1 and 6), which read on the last step of **clm 1**. The reference also teaches resuspending the sequencing product in various solvent such as water (e.g. Claim 23), which reads on the low ionic solution of **clm 2**. The reference also teaches subsequent electrophoresis

for DNA separation (a part of sequencing step) (e.g. p.2, line 9+; p.6, lines 6+) and/or mass spectroscopy (e.g. p.6, lines 6+), which read on the step of **clm 3**.

Leonard et al do not explicitly teach using a guanidine containing solution for the purification solution as recited in **clms 1** (step 3) and **clms 17**.

However, Bjerke et al, throughout the publication, teach purification of DNA sequencing products using magnetic particles and chaotropic agent such as guanidine solutions (e.g. Abstract; p.3, lines 1+; p. 6, lines 30+). The reference teaches dissolve the DNA sequencing product in the chaotropic guanidine solution (e.g. p.18), which reads on the solution comprising dye terminators of **clm 17** because the sequencing product comprises dye terminators.

Therefore, it would have been prima facie obvious for one of ordinary skill in the art at the time the invention was made to a chaotropic agent such as guanidine solution for the purification of DNA.

A person of ordinary skill in the art would have been motivated at the time of the invention to use a chaotropic agent such as guanidine for purification of DNA such as sequencing reaction products, because chaotropic agents such as guanidine are known in the art for DNA purification and chaotropic agents are known to enhance nucleic acid binding to solid support for purification, as taught by Bjerke et al (e.g. p.3, lines 1+; p.13, lines 1+).

A person of ordinary skill in the art would have reasonable expectation of success of achieving such modifications since the techniques for using various substrates (such as membranes) for purification of DNA using chaotropic agents such as guanidine solutions are routine and known in the art as demonstrated by Leonard et al and Bjerke et al.

Leonard and Others

10. Claims 1-3 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leonard et al (WO 01/19482; 3/22/2001; cited in IDS), in view of Bjerke et al (WO 02/44414; 6/6/2002; priority date 11/21/2001 or earlier; cited in IDS), and further in view of Brody et al (US 5,958,727; 9/28/1999) and Rando (US 5,202,456; 4/13/1993).

Leonard et al, throughout the publication, teach a method of purifying sequencing reaction product using ultrafiltration membrane to remove contaminant such as the dye terminators, as discussed above.

Bjerke et al, throughout the publication, teach purification of DNA sequencing products using magnetic particles and chaotropic agent such as guanidine solutions, as discussed above.

The combination of Leonard et al and Bjerke et al references does not explicitly teach using 1mM to 60mM guanidine solution as recited in **clms 18-20**. The combination of said references also does not explicitly teach the solution comprises EDTA as recited in **clm 16**.

However, Brody et al, throughout the patent, teach using various reagents and buffers for purification of various polynucleotides (e.g. Abstract). The reference teaches using solutions comprising 50mM Guanidine and EDTA for purification of DNA (e.g. col. 38, lines 63+), which the guanidine concentration falls within the concentration ranges of **clms 18** and **19**, as well as EDTA of **clm 16**.

Rando, throughout the patent, teaches using a guanidine solution with a concentration of 7mM for biological applications (e.g. col.7, line 54), which the concentration falls within the range recited in **clm 20**.

Therefore, it would have been prima facie obvious for one of ordinary skill in the art at the time the invention was made to using guanidine solutions with various concentrations as well as including EDTA in the solution.

A person of ordinary skill in the art would have been motivated at the time of the invention to use guanidine solution with various concentrations depending on the experimental design and the desired applications, as taught by Bjerke et al, Brody et al, and Rando. In addition, it would have been obvious to one skilled in the art to substitute one concentration for another as the various concentrations are known and routinely used in the art for manipulation of biological molecules such as DNA to achieve the predictable result of binding DNA to a substrate and subsequent purification of the DNA.

A person of ordinary skill in the art would have been motivated at the time of the invention to include EDTA in the solution, because EDTA is known and routinely used in the art for DNA manipulation such as the buffers taught by Brody et al. One skilled in the art would add EDTA as part of a solution to achieve the predictable result of DNA purification.

A person of ordinary skill in the art would have reasonable expectation of success of achieving such modifications since the techniques for using various concentrated guanidine solutions and solutions with EDTA for biological reactions such as DNA purification are routine and known in the art as demonstrated by Bjerke et al, Brody et al, and Rando.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sue Liu whose telephone number is 571-272-5539. The examiner can normally be reached on M-F 9am-3pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doug Schultz can be reached at 571-272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/SL/
Art Unit 1639
8/31/07

/Jon D. Epperson/
Primary Examiner, AU 1639